Santa Clara Valley
Water District

8

SANTA CLARA VALLEY WATER DISTRICT

HISTORY AND STATISTICS

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SANTA CLARA VALLEY WATER DISTRICT

HISTORY AND STATISTICS

1929-1998

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BOARDS OF DIRECTORS, OFFICERS, AND TERMS OF OFFICE

I. SANTA CLARA VALLEY WATER CONSERVATION ASSOCIATION: 12/1/26

***Board of Directors*:** (alphabetically)

Leroy Anderson (*President*)	San Jose
N. Barton	San Jose
K. E. Bracher	Santa Clara
John A. Fair	San Jose
Lloyd Gardner	Campbell
S. W. Hedegard	Campbell
Ed Howes	Los Gatos
Warren E. Hyde	Cupertino
W. K. Roberts	Sunnyvale
R. P. Van Orden	Mountain View
Max Watson (*Secretary*)	Agnew
James E. Weisendanger	Cupertino

II. SANTA CLARA VALLEY WATER CONSERVATION DISTRICT: 11/12/29—03/07/68

Secretary of District:

R. P. Van Orden	1929-1933
Leroy Anderson	1933-1937
Fay Logan Griffiths	1937-1942
Beth Townsend	1942-1946
Jean Worcester	1946-1949
Thelma M. Wright	1950-1962
Violet V. Enander	1962-1968

Attorney:

Herbert C. Jones	1929-1954
Albert T. Henley	1954-1968

***Chief Administration Officer*:**

J. Robert Roll	1948-1961
Glenn F. Dodson	1961-1968

Board of Directors:

Edgar A. Jackson	1929-1931
Leroy Anderson	1929-1933
John A. Fair	1929-1933
C. D. Cavallaro	1929-1935
J. Fred Holthouse	1929-1936
R. P. Van Orden	1929-1938
Sidney D. Farrington	1929-1950
Ralph F. Simons	1931-1935
William F. Noethig	1933-1937
Reginald L. Parry	1933-1955
Harry G. Mitchell	1935-1954
S. W. Pfeifle	1935-1962
True T. Tourtillot	1936-1938
James E. Wiesendanger	1937-1956
C. G. Spargur	1938-1953
Lloyd O. Wilcox	1938-1956
Frank L. Steindorf	1950-1954
Martin Spangler, Sr.	1953-1955
Herman J. Gerdts	1954-1966
Otto J. Pearson	1955-1956
Frank Polak	1955-1960
Edmund A. Mirassou	1955-1968
E. Vernon Holthouse	1956-1960
Joseph Jack Mariani, Jr.	1956-1960
Frank A. Wilcox	1956-1968
Joseph Chiri	1960-1968
James J. Lenihan	1960-1968
Robert T. Sapp	1961-1968
Dominic J. Ribisi	1962-1968
Roy Butcher	1966-1967
Richard A. Hardy	1967-1968

III. SANTA CLARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT: 11/01/54—03/05/68

Clerk of the Board of Supervisors:

Richard Olsen	1954-1960
Jean Pullan	1960-1968

Chief Administration Officer:

Donald K. Currlin	1954-1968

Board of Supervisors—Santa Clara County:

Walter S. Gaspar	1954-1956
J. M. McKinnon	1954-1956
A. W. Brown	1954-1958
Ed R. Levin	1954-1965
Sam P. Della Maggiore	1954-1968
Oran L. Slaght	1956-1960
Wesley L. Hubbard	1957-1961
Howard R. Weichert	1959-1962
Ralph H. Mehrkens	1960-1968
Martin Spangler	1962-1968
Sig Sanchez	1963-1968
Charles A. Quinn	1965-1968

IV. SANTA CLARA VALLEY WATER DISTRICT: 03/07/68—PRESENT

Clerk of the Board Directors:

Violet V. Enander	1968-1979
Susan A. Pino	1979-1995
Lauren L. Keller	1996-

General Manager:

Donald K. Currlin	1968-1972
John T. O'Halloran	1973-1989
Ronald R. Esau	1989-1994
Stanley M. Williams	1994-

Attorney:

Albert T. Henley	1968-1990
Anthony C. Bennetti	1990-

Board of Directors:

Victor F. Corsiglia, Sr.	1968-1972
Frank A. Wilcox	1968-1972
R. Jack Sturla	1968-1973
Joseph Chiri	1968-1979
Robert T. Sapp	1968-1981
Maurice E. Dullea	1968-1982
James J. Lenihan	1968-1997
Edmund A. Mirassou	1972-1976
Courtland M. Rush	1973-1981
Patrick T. Ferraro	1973-1995
Linda Peralta	1976-1982
Arthur T. Pfeiffer	1979-1982
Robert Gross	1981-
Sig Sanchez	1981-
Audrey H. Fisher	1982-1986
Joseph H. Donohue	1983-1993
Joe Pandit	1983-1993
Joe Judge	1986-
Rosemary C. Kamei	1993-
William Gissler	1994-1995
Larry Wilson	1995-
Tony Estremera	1996-
Gregory Zlotnick	1997-

HISTORICAL FACTS

November 12, 1929	Santa Clara Valley Water Conservation District was created by public vote under provisions of the Water Conservation Act of 1929 (Jones Act) to alleviate land surface subsidence in and around San Jose. The District included about 350 square miles of the valley which overlay the groundwater basin between Coyote and Palo Alto. The plan was to construct large dams to capture winter rains which would be used to recharge aquifers and wells.
November 1931	First Bond Election held for $6 million, but failed by over 7 to 1 due to depressed economy.
June 19, 1934	First bond issue passed ($2 million) for construction of District's first six dams and reservoirs.
1935	Completion of five dams: Calero, Almaden, Guadalupe, Vasona, and Stevens Creek.
1936	Coyote Dam completed.
May 12, 1936	$400,000 bond issue approved by voters for completion of Coyote Project.
1940-1950	The concept of the San Felipe Project to tap into water from the federal Central Valley project was born.
October 7, 1947	$2.5 million successful Lexington Dam Bond Election.
1948	J. Robert Roll became Chief Administration Officer.
1949	$3 million successful Anderson Dam Bond Election held.
1950	Anderson Dam completed.
1951	$850,000 successful Lexington Dam Bond Election held to allow for escalated costs.
July 10, 1951	Santa Clara County Flood Control and Water Conservation District created and placed under the direction of the County Board of Supervisors pursuant to Special Legislative Act.
1952	First cloud seeding began.
1952	The concept of the Guadalupe River Flood Control project was born.
1952	Lexington Dam completed.

Historical Facts (continued)

1954	Office moved from Hamline Street to First and Hedding Streets.
November 1, 1954	Central Santa Clara Valley Water Conservation District annexed to Santa Clara Valley Water Conservation District.
October 2, 1956	$6.4 million successful Northwest Flood Control Zone G.O. Bond Election held.
1961	Glenn F. Dodson became Chief Administration Officer.
November 20, 1961	Contract signed with the State to import water from the future South Bay Aqueduct of the State Water Project.
1962	Office moved to 70 West Hedding Street.
June 11, 1963	$42,050,000 successful Water G.O. Bond Election held.
October 8, 1963	$12,750,000 successful North Central Flood Control Zone G.O. Bond Election held.
July 1, 1964	Santa Clara County Flood Control and Water Conservation District changed name to Santa Clara County Flood Control and Water District (eliminated word "Conservation").
1965	First deliveries of water made through the South Bay Aqueduct and Central Pipeline.
June 1967	Rinconada Water Treatment Plant went on-line. This was the District's first water treatment plant, with a capacity to treat 80 million gallons per day.
1968	Office moved to 516 East Martha Street.
March 7, 1968	Santa Clara Valley Water Conservation District ended its existence by merging with Santa Clara County Flood Control and Water District governed by an independent Board. Donald Currlin became General Manager. Gavilan Water District declined the merger.
1969	District has significantly replenished groundwater basin and halted land surface subsidence.
March 1972	District headquarters moved into new building at 5750 Almaden Expressway.
1973	John T. O'Halloran appointed General Manager upon retirement of D. Currlin.

Historical Facts (continued)

January 1, 1974	Santa Clara County Flood Control and Water District changed name to Santa Clara Valley Water District.
July 1974	Penitencia Water Treatment Plant went on-line.
1976-77	Historic drought years. District Conservation Education Program established. Conservation reached 22 percent less water used in 1977 than in 1976.
May 25, 1977	Palo Alto Water Reclamation Facility dedicated.
May 25, 1977	Gilroy Water Reclamation Facility went on-line.
May 31, 1977	$56 million first Water Revenue Bonds approved by voters.
June 7, 1977	San Felipe Contract with Bureau of Reclamation signed.
1979	The U.S. Bureau of Reclamation started construction of the San Felipe Project.
June 9, 1981	Benefit assessment levied in flood control zones by Board for 1 year.
1982	Construction began on Lower Llagas Creek Flood Control Project.
June 8, 1982	Voters approved flood control benefit assessment for 10 years subject to limit of 2 percent annual rate increase.
1983	Construction began on the Coyote Creek Flood Control Project.
November 6, 1984	Voters authorized issuance of Water Utility Revenue Bonds as needed.
1987-1993	Historic drought years. Water conservation peaked in 1991 at 28 percent less usage than normal.
1987	First deliveries of San Felipe water completed.
1987	South County residents voted to consolidate Gavilan Water District with SCVWD, adding three percolation ponds and two reservoirs, Chesbro and Uvas, to the District's system.
1989	Santa Teresa Water Treatment Plant went on-line.
July 1, 1989	Ronald R. Esau appointed General Manager upon retirement of J. O'Halloran.

Historical Facts (continued)

October 1989	Leased 14,716 square feet of office space at Camden Avenue building.
November 22, 1989	Purchased Hubbard and Johnson building on Winfield (19,950 square foot building and 15,000 square foot warehouse).
June 26, 1991	Purchased building on Allencrest Drive (10,000 square feet).
1992	Construction began on the Guadalupe River Flood Control Project through downtown San Jose, paving the way for the Guadalupe River Park.
December 7, 1992	Purchased Standard Brands Paint Store on Blossom Hill Road (16,000 square feet).
June 1993	Milpitas Pipeline completed.
November 15, 1994	Stanley M. Williams appointed General Manager upon retirement of Ronald R. Esau.
December 1995	Lower Llagas Creek Flood Control Project completed.
December 1995	Coyote Creek Flood Control Project completed.
1996	District receives its first Distinguished Budget Presentation Award from the Government Finance Officers Association.
November 1996	Proposition 218 passes; eliminates provision for voter-approval of continued benefit assessment funding, special tax or utility fee still possible.
November 26, 1996	Lexington Dam renamed James J. Lenihan Dam at Lexington Reservoir.
July 15, 1997	Groundbreaking held for new 91,000 square foot Headquarters Building. The 3-story building will cost an estimated 17 to 19 million dollars.
March 1998	30-year anniversary of the District assuming responsibility for both water supply and flood management in Santa Clara County.

FLOODING HISTORY

Winter 1910-11	Worst flooding on record (since the opening of the Weather Bureau in 1905). Four inches of rain fall in downtown San Jose in a 24-hour period.
February 1914	Levees broken—situation critical. San Jose is over 5 inches above normal rainfall for entire season.
January 1916	San Jose deluged. Many interruptions in service of gas and electric company and telephone company. Creeks are all overflowing their banks.
February 1927	Greatest storm in California's history; 3,000 Californians left homeless. Coyote Creek overflowed its banks north of Milpitas Road, and the Guadalupe overflowed its banks near Alviso.
December 1931	Flood streams mean huge waste of needed water. Guadalupe and Coyote Creeks spilled over into the lowlands near Agnew and Alviso flooding hundreds of acres.
February 1937	Heavy rains damage roads and flood Little Alviso. Page percolation dam overflows. Madrone underpass flooded twice in 9 days and toppled an 8,000-gallon water supply tank.
February 1938	Storm drenches Santa Clara Valley within 24 hours of constant rainfall leaving transportation crippled by land, sea, and air and inundating acres of orchards and pastureland south of Alviso.
February 1940	Storm causes estimated half-million dollars damage in County—submerged Alviso.
January 1942	Rainfall sets all-time mark for San Jose; nearly 1-inch fell in 1 hour—an all-time record. Ditches overflowed into roads throughout the valley flooding many intersections. Storm drains choked; power failed.
January 1943	Severe storm results in four dead in Gilroy area.
December 1951	Heavy rains swamp Alviso—5.6 inches of rain to date versus average of 2.70 inches. Floods soaked Alviso nearly the entire month.
January 1952	Flooded Silver Creek area in Evergreen. Fifteen families flee homes in Campbell (San Tomas District). Entire population of Alviso evacuated in "worst flood" to date.
December 1955	Famous "Christmas Week" floods left thousands homeless. South County watershed severely flooded. Alviso floods again.

Flooding History (continued)

January 1956	Alviso floods.
February 1958	Saratoga Creek overflows—residents evacuate. South County watershed severely flooded. Many streets in San Jose flooded. Alviso washed out as creek and tide meet.
October 1962	At least nine families evacuated from homes due to San Tomas Creek overflowing. Storm fills creeks and topples trees—massive traffic problems.
February 1963	All but three reservoirs dumping water over spillways. Gilroy and Morgan Hill are the hardest hit. Stevens Creek Boulevard flooded. Saratoga Creek wipes out bridge. Miller Slough goes over its banks. Schools closed. Emergency shelter set up at Veterans Memorial Building.
January 1968	Six-inch rainstorm floods valley. Seventy-five-year old Los Gatos woman climbs out of window as water sweeps through home. Santa Clara basements turning into swimming pools.
February 1969	Coyote Creek spills due to backup through a storm drain. Rescues made by rowboat at mobile court on Old Oakland Road. Milpitas farmlands flooded.
November 1982	San Jose has 6.07 inches of rainfall—normal to date is 1.77 inches. Power outages throughout valley. Alviso floods again. Storm continues through December; 5,000 residents without power; at least eight people lose their lives.
January 1983	Rains continue. Twenty rest home residents evacuated in Cupertino. Third storm in 4 days due; 12.36 inches of rain so far this season versus normal rainfall of 6.52 inches. Officials gear up for widespread flooding. Hillsides in extreme danger. Residents commute by boat on Meridian Avenue. Anderson Reservoir spills into Coyote Creek. Reagan approves U.S. Disaster aid for area.
February/March 83	Storms continue—3/1: San Jose has 20.35 inches of rain so far versus 9.65 inches in a normal year. Alviso levees break. Thousands flee; emergency shelters set up. San Jose sewage plant cut off by floodwaters and in danger of spilling. Milpitas evacuates 900 homes; evacuation center opens at Ayers High School. Two Los Altos schools evacuated when flood control channel overflows. Rains make mud pie of winter field crops. Alviso stays flooded for at least 2 weeks leaving 1,700 people homeless and causing $11 million in damage.

Flooding History (continued)

February 1986	Huge storm swamps area, stalls traffic, and kills power for 75,000 in Santa Clara and San Mateo Counties. Five inches of rain dumped in 24 hours; worst storm in 3 years. Calabazas Creek overflows—severe mudslides. State of emergency declared on Uvas Creek; San Jose activates National Guard to help. Residents flee San Jose as Guadalupe River spills its banks. Emergency shelter set up at the Willow Glen High School. Residents of Bonnie View Mobile Park evacuated as Los Gatos Creek jumped its banks. More than 18,000 gallons-a-second poured over the Lexington spillway. Damage estimated at $100 million.
January 1995	Storm hits. Guadalupe River overflows banks in downtown San Jose. Water reaches 15-foot depth in some underpasses beneath Highway 87. Morgan Hill RV Park under 2 feet of water. Mayor Hammer declares state of emergency after 300 residents flee homes flooded by the Guadalupe River overflow. About 75,000 County residents without power. President Clinton declares County federal disaster area. Damage estimated at over $4 million.
March 1995	Storms unleash new assault—reservoirs already full and ground saturated. Little Llagas Creek overflows; one dead. Seven reservoirs overflowing. More than 200 people evacuated from San Jose's downtown area. Traffic comes to a halt; numerous streets and expressways closed, including Highway 87. Downtown workers, including City Hall and County government personnel, sent home. Guadalupe rises 2 feet in 2 hours; extensive mudslides on Highway 17. Congressman Mineta tours area and voices concern about plans for flood control projects.
January 26, 1997	Anderson Reservoir spills; major flooding along Coyote Creek; considered the "flood of record" since completion of the Coyote-Anderson System. Over 400 properties flood; more than 200 people evacuated from homes.
February 1, 1998	Emergency Operations Center opens as El Niño-driven rainfall begins drenching Santa Clara Valley. Over 1.1 million sandbags distributed throughout the County.
February 3, 1998	All ten (10) reservoirs spilling. Over 40 homes flooded in Milpitas near confluence of Calera and Berryessa Creeks. Heavy rains cause evacuation along San Francisquito and Calabazas Creeks.
May 29, 1998	May's 13th day of rain breaks all previous monthly rainfall records; Area reaches 3rd place in the year-to-date rainfall record book with 28.72 inches measured since July 1997. Second place goes to 1982-83 with 30.25 inches, and first place remains 1889-90, with 30.30 inches.

EVOLUTION OF THE SANTA CLARA VALLEY WATER DISTRICT

WCD = Water Conservation District

1929 — Santa Clara Valley WCD approved by voters (initially a special district managed by farmers who contracted with engineers; later managed by elected board).
Responsibilities: Develop and manage a reliable water supply. Constructed six reservoirs by 1936; two more by 1952.
Area: Santa Clara Valley from east to west foothills; from Adobe Creek in Palo Alto to Coyote Narrows (Metcalf Road).

1938 — South Santa Clara Valley WCD approved by voters (renamed to Gavilan Water District in 1980). Special district with elected board.
Responsibilities: Groundwater management; built Chesbro and Uvas reservoirs.
Area: Valley area between east and west foothills; from county's south boundary to Morgan Hill area.

1949 — Central Santa Clara Valley WCD approved by voters; special district with elected board.
Responsibilities: Obtain water rights on Coyote Creek and manage groundwater.
Area: Narrow valley area from Coyote Narrows to Morgan Hill.

1952 — Santa Clara County Flood Control & WCD formed under the county Board of Supervisors through act of state legislature.
Responsibilities: Flood control and management of county's drainage.
Area: Countywide. Formed five flood control zones based on the county's major drainage areas; each zone is a separate fiscal entity.

1950s — Tri-County Water Authority created by the state legislature to study and make recommendations for importing water into Santa Clara, San Benito, Alameda, Santa Cruz and Monterey counties; authority was dissolved in 1966 after identifying need to build San Felipe project.

1954 — Annexation: Santa Clara Valley WCD annexes the Central Santa Clara Valley WCD with the latter district's voter approval.

1964 — Groundwater pumping taxes begin: Santa Clara County Flood Control & WCD began construction of the Central Pipeline and began a groundwater extraction charge (pump tax). Meanwhile, Santa Clara Valley WCD began applying groundwater charges. The need for a uniform approach to groundwater charges quickly became evident.

1968 — Merger: County supervisors recognized need for specialized knowledge to oversee the construction and operation of water and flood control facilities, along with administering pumping fees. They approved merging the Santa Clara County Flood Control & WCD with the Santa Clara Valley WCD, creating today's Santa Clara Valley Water District. The new district retained Santa Clara Valley WCD's elected board and added two supervisorial appointees. The two staffs were combined, and a countywide agricultural advisory committee and a water commission (including representatives from water retail agencies) were established. The merger:
- Enabled integrated water resource management, addressing both water supply and flood control through one agency.
- Eliminated duplication of effort.

1987 — Annexation: Santa Clara Valley Water District (SCVWD) annexed the Gavilan WCD with approval of Gavilan voters.
Benefits of annexation:
- Put all county dams, reservoirs and percolation facilities under one agency's control, enabling releases from reservoirs to be coordinated for maximum benefit.
- Duplication of administrative overhead was eliminated.
- Provided Gavilan area well owners with a lower pump tax by eliminating Gavilan's administrative costs.

Today's Santa Clara Valley Water District represents three consolidations and provides countywide integrated water resource management (both water supply and flood control).

SOURCE: Santa Clara Valley Water District Public Information Office
2/21/95

EVOLUTION OF SANTA CLARA VALLEY WATER DISTRICT TAXES AND WATER CHARGES

Historical Events

1929
Santa Clara Valley Water Conservation District (WCD) Begins Operations

1949
Merged with Central Santa Clara Valley WCD

1965
State Water Project

1968
Merged with Santa Clara County and Flood Control and WCD

1987
Merged with Gavilan WCD

1989-1992
Mandatory Conservation

Taxes and Water Charges

1963
Pricing Policy

1964
Groundwater Charges in Santa Clara Valley Groundwater Basin
County Ad Valorem Taxes

1967
Rinconada Water Treatment Plant (Treated Water Surcharge)

1971
Water Taxing and Pricing Policy

1978
Proposition 13
State Water Project Tax

1985
Deleted Hetch Hetchy Rebate

1987
Central Valley Project (Collect Groundwater Charges in Llagas & Coyote Groundwater Basin)

1996
Water Taxing and Pricing Policy

1997
Proposition 218

GENERAL FACTS

Population: January 1, 1997: Estimated January 1, 2000:	1,653,135 1,689,600
Total County Assessed Value (1997-98):	$133,247,621,419
Gross Area of Santa Clara County:	849,000 acres 1,300 square miles
Service Area	15 cities
Public and Private Water Retailers Served	13
Total Length of Flood Control Facilities:	642 miles
Length of Flood Control Channels Adequate for 1 Percent Flood:	350 miles
Existing Development Subject to Flooding:	97 square miles
Annual Tax and Assessment of Average Home to SCVWD:	$86 per year
Reservoir Storage Volume (District):	169,608 acre-feet
District Flood Control Right of Way: Fee Easement Total	 2,744 acres 2,636 acres 5,380 acres

Zone	Benefit Assessment	Tax for $200,000k AV Home	Total
Northwest	55.50	45.63	101.13
North Central	16.52	39.91	56.43
Central	37.90	44.43	82.33
East	34.68	55.71	90.39
South	55.50	45.91	101.41

WATER SUPPLY AND QUALITY

Water Use:

125,650,000,000 (386,000 acre-feet) gallons of water were used by homes, businesses, industries, and agriculture in Santa Clara County during 1997.

The Sources of Our Water During 1997 Were as Follows:

Percentage	Source
44	Local reservoirs and groundwater
16	State Water Project via South Bay Aqueduct
24	Central Valley Project via San Felipe facilities
16	San Francisco via Hetch Hetchy

Santa Clara County Water Use in 1997 Was as Follows:

Percentage	Source	Acre-Feet
9	Agriculture	35,000
91	Municipal and Industrial	351,000

By the year 2020, with 1.9 million population, the County's annual water demand is expected to be about 515,000 acre-feet per year. This is anticipated to be reduced by approximately 45,000 acre-feet to 470,000 acre-feet through various water conservation efforts.

Gross municipal and industrial use in 1997 was about 185 gallons per capita per day.

The County's three groundwater subbasins (Santa Clara, Coyote, and Llagas) have an estimated operational storage capacity of 455,000 acre-feet.

Santa Clara subbasin index well (1997) maximum depth to water was 30 feet. A depth of 120 feet in the index well approaches the level at which subsidence may be expected to recur.

Santa Clara County Gross Per Capital Municipal and Industrial Water Use:

Year	Gallons Per Day
1975	223
1976	241
1977	204
*1978	179
1979	201
*1980	202
1981	205
*1982	194
*1983	189
*1984	160
1985	222
1990	172
1993	168
1994	176
*1995	175
*1996	179
*1997	185

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*Above average rainfall years

Minimum/Maximum Parts Per Million Reached at the Delta Pumping Plant

	Sodium(1)	Chloride(2)	TDS(3)
1974	15/50	20/55	120/280
1975	15/50	20/50	120/265
1976	15/75	20/100	125/400
1977	75/190	100/300	400/750
1978	25/50	25/50	145/575
1979	25/75	25/135	165/390
1980	20/50	25/35	140/200
1981	20/66	22/93	133/344
1982	16/52	17/69	111/283
1983	12/52	12/70	90/281
1984	20/37	22/47	132/216
1985	29/89	32/138	175/387
1986	21/59	23/91	136/301
1987	28/102	35/165	193/462
1988	36/106	44/172	233/465
1989	18/99	22/164	137/504
1990	40/108	58/175	218/466
1991	21/102	18/162	160/437
1992	30/99	41/161	208/457
1993	12/57	14/86	94/293
1994	44/83	56/128	350/236
1995	17/55	17/66	105/296
1996	13/47	15/54	112/270
1997	16/43	24/102	113/325

(1) There are no state or federal drinking water standards for sodium, but the National Academy of Science recommends a sodium limit in drinking water of 20 ppm for people on severely restricted sodium diets and 100 ppm for those on moderately restricted diets. Valley wells have levels of about 50 ppm. A water softener produces water of about 200 ppm.

(2) Chloride levels of 100 ppm have caused corrosiveness in treated water contractor pipelines, resulting in "red water." We have agreed to notify the treated water customers when we reach that level. We added a chemical, zinc orthophosphate, to inhibit corrosiveness of chloride.

(3) TDS is Total Dissolved Solids, an overall measure of the mineral content of water and its suitability for domestic, industrial and agricultural use.

NORTHWEST ZONE	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
Adobe Creek	10.84	8.83	3,080
Arastradero Creek	1.13	0.91	360
Barron Creek	3.09	5.08	830
Bayfront Levees—NW		5.87	0
Deer Creek	1.60	2.46	740
Hale Creek	4.80	2.80	1.130
Heney Creek	0.64	0.72	320
Los Trancos Creek	7.25	5.83	2,330
Magdalena Creek	1.28	0.57	540
Matadero Creek	13.57	5.91	2,930
Palo Alto Flood Basin	27.50	4.92*	4,028**
Permanente Diversion	8.96	1.33	2,400
Permanente Creek	8.11	11.00	2,400
Purissima Creek	1.25	0.50	400
Stanford Channel	1.08	1.56	330
Stevens Creek	38.04	20.22	7,340
San Francisquito Creek	42.04	8.04	9,250
Total		90.96	

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* Length of Basin Levees
** Inflow of Basin is 6,992 cfs

NORTH CENTRAL ZONE	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
Bayfront Levees		11.00	0
Booker Creek	0.50	0.71	320
Calabazas Creek	20.67	12.73	4,300
Daves Creek	0.61	1.55	60
El Camino Storm Drain	2.83	2.77	660
Guadalupe Slough		6.06	9,130
Junipero Serra Channel	1.25	2.50	300
Mistletoe Creek	0.58	0.20	200
Page Ditch	0.38	0.95	230
Prospect Creek	1.44	1.14	634
Regnart Creek	3.41	2.83	690
Rodeo Creek	1.53	1.70	530
San Andreas Creek	2.00	1.84	880
San Tomas Aquino Creek	39.06	16.08	9,130
Sanborn Creek	1.02	0.60	320
Saratoga Creek	16.56	12.71	4,085
Smith Creek	2.65	1.82	1,030
Sobey Creek	0.63	0.63	285
Sunnyvale Outfall East	6.35	6.34	1,050
Sunnyvale Outfall West	4.10	3.23	520
Vasona Creek	1.43	0.98	695
Wildcat Creek	4.12	3.48	1,590
Total		91.85	

CENTRAL ZONE	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
Alamitos Creek	37.96	7.42	8,860
Almendra Creek	1.08	1.30	415
Bayfront Levees-C		6.40	0
Calero Creek	12.39	3.73	2,100
Canoas Creek	18.62	7.40	2,350
East Ross Creek	0.80	1.23	500
Golf Creek	3.08	2.13	1,170
Greystone Creek	1.38	0.98	640
Guadalupe Creek	15.24	8.17	3,000
Guadalupe River	170.64	19.83	22,500
Herbert Creek		2.08	2,050
Lone Hill Creek	1.29	1.07	600
Los Gatos Creek	54.83	22.99	7,980
McAbee Creek	.50	0.61	260
Pheasant Creek	1.40	0.93	2,550
Randol Creek	2.28	1.76	930
Rincon Creek	2.57	1.82	1,100
Ross Creek	9.96	5.59	1,900
Santa Teresa Creek	1.99	2.27	860
Shannon Creek	1.20	1.23	620
Short Creek	0.50	0.29	270
Total		99.23	

EAST ZONE	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
Berryessa Creek	21.19	9.66	5,700
Calera Creek	2.93	3.13	920
Coyote Creek	321.62	42.14	15,000
Cribari Creek	1.53	0.34	320
East Penitencia Creek	1.70	0.68	340
Evergreen Creek	1.98	2.86	500
Fisher Creek	15.78	7.99	4,000
Flint Creek	1.98	1.52	525
Fowler Creek	2.78	2.85	630
Las Animas Creek	12.10	4.66	4,150
Los Coches Creek	4.02	3.41	1,420
Lower Penitencia Creek	27.20	4.13	7,000
Lower Silver Creek	43.50	7.15	5,500
Miguelita Creek	4.49	4.05	600
North Babb Creek	2.57	1.29	300
Norwood Creek	2.18	3.13	440
Packwood Creek	10.10	10.89	3,500
Piedmont Creek	1.93	1.46	725
Quimby Creek	2.17	2.05	440
Ruby Creek	1.55	1.61	260
San Felipe Creek	8.00	29.17	4,000
Scott Creek	1.01	3.75	320
Shingle Creek	3.40	6.06	1,400
Sierra Creek	.77	2.10	400
South Babb Creek	4.00	3.61	920
Sweigert Creek	.94	0.36	190
Thompson Creek	17.99	8.81	3,600
Tularcitos Creek	1.98	0.86	740
Upper Penitencia Creek	23.91	11.04	4,640
Upper Silver Creek	5.96	7.24	1,800
Yerba Buena Creek	2.58	1.52	530
Total		185.77	

SOUTH ZONE	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
Alamias Creek	3.24	2.65	1,200
Bodfish Creek	13.61	9.85	4,300
Burchell Creek		1.23	500
Center Creek	0.80	1.04	400
Church Creek	1.87	2.12	680
Corrallitos Creek	7.07	2.47	2,400
Crews Creek	2.06	2.08	970
Croy Creek	2.93	1.52	1,400
Day Creek	.50	0.68	500
Dexter Creek	1.70	0.87	770
East Little Llagas Creek	21.43	4.32	6,700
Edmundson Creek	1.20	1.04	580
Foothill Creek	0.63	0.28	320
Gavilan Creek	2.30	3.41	990
Hayes Creek	1.29	0.76	650
Jones Creek	11.50	3.98	3,700
Lions Creek	4.12	3.22	1,870
Little Arthur Creek	9.46	6.53	3,400
Little Uvas Creek	7.00	4.17	2,300
Live Oak Creek	1.50	2.05	470
Llagas Creek	104.21	33.57	20,000
Machado Creek	1.34	0.98	650
Madrone Channel	3.21	4.10	1,200
Maple Creek	0.63	0.38	350
Morey Channel	0.76	0.76	420
New Creek	1.51	1.70	670
North Morey Channel	1.02	0.30	490
Ortega Creek		2.37	570
Panther Creek	1.48	1.02	530
Paradise Creek	1.0	0.66	495
Princevalle Drain	3.75	2.56	1,400
Rucker Creek	2.34	1.14	841

SOUTH ZONE (CONTINUED)	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
San Martin Creek	4.18	1.74	1,320
San Ysidero Creek	4.26	3.86	1,600
Sargent Creek		1.70	680
Skillet Creek	1.31	1.59	480
Solis Creek	0.94	1.14	600
South Corrallitos Creek	.50	0.68	360
South Panther Creek	.50	0.91	260
Tar Creek	6.39	7.20	2,700
Tennant Creek	3.66	1.82	1,400
Tick Creek	3.55	2.84	1,400
Uvas-Carnadero Creek	87.50	32.20	16,300
West Branch Llagas Creek	17.80	9.17	6,400
West Little Llagas Creek	5.55	4.63	2,300
Total		174.04	

ZONE	Drainage Area (square miles)	Length (miles)	Q for 1% Flood at Outfall (cfs)
Northwest		90.96	
North Central		91.85	
Central		99.23	
East		185.77	
South		174.04	
Total		641.85	

MAJOR CHANNELS

Location	Drainage Area (S.O.M.J.)	Channel Length (miles)	1 Percent Flow (cfs)
Northwest Flood Control Zone			
Adobe Creek D/S Barron Creek	14.0	10.0	3,900
Barron Creek @ Adobe Creek	.0	5.0	830
Inflow to Palo Alto Flood Basin	27.0		6,800
Los Trancos @ San Francisquito	7.04	7.0	2,300
Matadero Creek @ Bayshore	14.0	7.0	2,900
Permanente Creek @ Diversion	9.0	7.0	2,800
San Francisquito Creek @ Outfall	42.0	9.0	9,300
Stevens Creek @ Bayshore	38.0		8,300
Permanente Creek @ Bayshore	8.0	11.0	2,400
North Central Flood Control Zone			
Calabazas @ Highway 237	21.0	13.0	4,300
San Tomas D/S Saratoga Creek	29.0	12.0	9,100
Saratoga @ San Tomas Creek	17.0	15.0	4,100
Central Flood Control Zone			
Guadalupe River @ Highway 237	171.0	28.0	22,000
Los Gatos @ Guadalupe River	55.0	24.0	8,000
Ross Creek @ Guadalupe River	10.0	6.0	2,000
East Flood Control Zone			
Coyote Creek @ Highway 237	322.0	31.0	14,500
Lower Silver Creek @ Coyote	44.0	7.0	5,500
Upper Penitencia Ck @ Coyote Ck	24.0	11.0	4,600
South Flood Control Zone			
Llagas Creek @ Pajaro River	90.0	30.0	19,000
Uvas Carnadero @ Pajaro River	88.0	28.0	16,300

TOTAL FLOOD CONTROL CHANNEL LENGTHS (MAJOR AND MINOR CHANNELS)

Zone	Total Length (miles)
Northwest	91
North Central	92
Central	99
East	209
South	176
Total	667

Name	Location	Number of Ponds and Areas	Total Surface Storage in Acres	Maximum Recharge Rate, Acre-Feet Per Day	Source of Water
Alamitos	West of Guadalupe River and south of Blossom Hill Road	2	11	15	Local and imported
Budd	Southwest of the intersection of Budd Avenue and San Tomas Expressway	3	9	24	Local and imported
Camden	About ¼-mile south of San Tomas Expressway between Dell Avenue and Highway 17	3	62	20	Local and imported
Church	At intersection of Llagas and Church Avenues	3	42	12	Local
Coyote	About ½-mile north of Metcalf Road and west of Highway 101 on Coyote Creek	1	30	56	Local and imported
Ford Road	About ½-mile east of Highway 101 and Monterey Highway intersection on Coyote Creek	4	34	40	Local
Guadalupe	Along Guadalupe River about ¼-mile north of Blossom Hill Road near Almaden Expressway	4	31	27	Local

Name	Location	Number of Ponds and Areas	Total Surface Storage in Acres	Maximum Recharge Rate, Acre-Feet Per Day	Source of Water
Kooser	About ¼-mile east of Camden Avenue between Kooser Road and Tobias Drive	4	2	10	Imported
Los Capitancillos	North of Guadalupe Creek between Almaden Expressway to the east and Park Crest Drive to the west	10	63	30	Imported
Madrone	Near Morgan Hill parallel to and east of Highway 101 from Half Road to Llagas Creek	10	6.5	30	Local and imported
Main Avenue	About 1 mile northeast of Morgan Hill, southwest of the Main Avenue and Hill Road intersection	5	6	10	Local and imported
McClellan	Southwest corner of McClellan and Bubb Roads	2	2.5	4	Imported
Mc-Glincey	East of Highway 17 about ½-mile north of Camden Avenue	6	7	50	Local and imported
Oka Lane	East of Los Gatos Creek north of Oka Lane extension	3	17	10	Local and imported

Name	Location	Number of Ponds and Areas	Total Surface Storage in Acres	Maximum Recharge Rate, Acre-Feet Per Day	Source of Water
Overfelt	Overfelt Gardens northwest of McKee Road. One pond southeast of Mabury Road next to Penitencia Creek	4	6	8	Local and imported
Page	West of Winchester Boulevard between Hacienda and Sunnyoaks Avenues	8	14	28	Local and imported
Penitencia	Along Penitencia Creek from Noble Avenue to West of Capitol Avenue	6	24	17	Local and imported
San Pedro	In San Martin at Hill Road and San Pedro Avenue	7	20	—	Imported
Sunnyoaks	West of Winchester Boulevard between Sunnyoaks Avenue and Waldo Road	9	3	8	Local and imported
	Total	94	390	399	

CENTRAL VALLEY PROJECT
SAN FELIPE DIVISION

STATUS

Water started flowing to Santa Clara County in June 1987. Dedication ceremonies for the San Felipe Division of the Central Valley Project were held August 8, 1987. Construction of the San Felipe Division was authorized in 1967. The first contract was awarded September 8, 1987. Now, all the facilities, except the control systems, to be maintained by Santa Clara Valley Water District (SCVWD) were transferred in January 1988.

PURPOSE

The San Felipe Division is a conveyance facility to provide a supplemental water supply in Santa Clara, San Benito, Monterey, and Santa Cruz Counties for irrigation, municipal, and industrial use. It prevents further mining of the groundwater in Santa Clara County, replaces boron contaminated water in San Benito County, and will provide water to coastal areas in Santa Cruz and Monterey Counties.

SUPPLY

The project has a capacity to supply about 216,000 acre-feet (266 million cubic meters) annually by the year 2020. Water is delivered to the service areas not only by direct diversion from the distribution systems, but also through the expansion of the large groundwater recharge operation now being carried out by local entities. The majority of the water supply, about 150,000 acre-feet (185 million cubic meters), will be used for municipal and industrial purposes.

FACILITIES

Construction of project works to supply about 20,000 acre-feet (24.7 million cubic meters) for Monterey and Santa Cruz Counties is being deferred for the present time. The facilities required to serve Santa Clara and San Benito Counties include 54 miles (87 kilometers) of tunnels and conduits, two large pumping plants, and one reservoir.

About 50 percent of the water conveyed to Santa Clara County is recharged into the underground basins for agricultural and municipal uses, and the balance is treated for direct municipal and industrial delivery. Nearly all of the water provided to San Benito County is delivered via surface facilities. A distribution system has been constructed in San Benito County to provide supplemental water to about 19,700 arable acres (8,000 hectares).

Water is conveyed from the Delta of the San Joaquin and Sacramento Rivers through the existing Delta-Mendota Canal. It is then pumped into the existing San Luis Reservoir and diverted through the 1.8 miles (2.9 kilometers) of Pacheco Tunnel Reach 1 to Pacheco Pumping Plant. Twelve 2,000 horsepower pumps lift a maximum of 480 feet^3/s (14.5 m^3/s a distance varying from 85 feet (25.9 meters) to 300 feet (91.4 meters) to the 5.3-mile long (8.5 kilometers) Reach 2 of Pacheco Tunnel. The water then flows through the tunnel without additional pumping and continues through 29 miles

(46.7 kilometers) of concrete, high pressure pipeline, varying in diameter from 10 feet (3 meters) to 8 feet (2.4 meters) and a 1.0 mile long (1.8 kilometers) Santa Clara Tunnel. The pipeline terminates at Coyote Pumping Plant. Coyote Pumping Plant is capable of pumping water to Coyote Creek or Calero Reservoir.

The Hollister Conduit branches off the Pacheco Conduit 8.0 miles (12.9 kilometers) from the outlet of the Pacheco Tunnel. This 19.2-mile long (30.6 kilometers) high-pressure pipeline, with a maximum capacity of 83 feet^3/s (2.35 cubic meters per second), terminates at San Justo Reservoir.

The 9,900 acre-foot (12.2 million cubic meters) capacity San Justo Reservoir is located about 3 miles (4.8 kilometers) southwest of the City of Hollister. This reservoir regulates San Benito County's imported water supplies, allows pressure deliveries to some of the agricultural lands in the service area, and provides storage for peaking of agricultural water.

ACCOMPLISHMENTS

An imported water supply from the San Felipe Project helps stabilize the economy in the service areas by insuring adequate water for both irrigation and municipal uses. Without additional imported water, groundwater pumping will exceed the long-term safe yield of the basin, resulting in possible land subsidence with its attendant monetary losses.

Operation of the project results in sustained water levels in seven existing reservoirs during the warm season. This is a considerable advantage to the fishery and recreation users since many of the reservoirs are dry during the later summer and fall periods.

The reliability of the area's water supply systems due to seismic activity is improved by adding import facilities. These additional facilities increase the chances that more facilities will remain operational during a seismic event and, therefore, minimize community disruption from distribution system's failure.

COSTS

The project was completed in 1988. The estimated cost of the San Felipe Division is $296 million.[1] An additional $49 million will be spent on the proposed Watsonville facilities/conduit.

RECREATION

Recreation is incidental to the operation of San Justo Reservoir; however, stabilization of seven existing reservoirs provides additional recreation opportunities.

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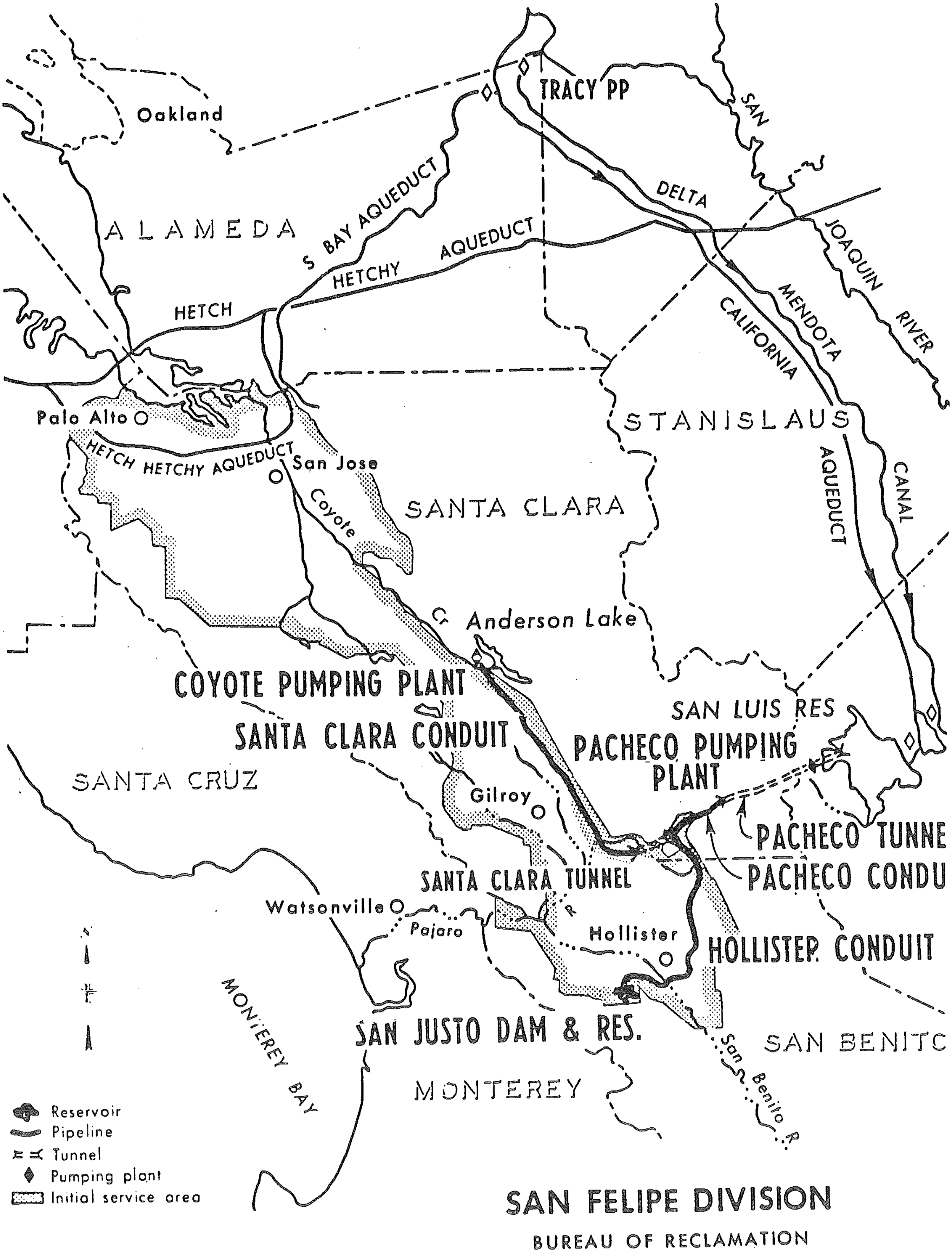
[1] Total expenditure, as of September 1987. This includes contract costs, noncontract costs, land rights, and other costs.

CONSTRUCTION PROGRAM			
Facility	**Length**	**Diameter**	**Capacity**
Pacheco Tunnel	1.8 miles lower level 5.3 miles upper level	13 feet circular lower level 9.5 feet circular upper level	490 cubic feet per second
Pacheco Pumping Plant 12 units—24,000 hp total 309 feet maximum lift			490 cubic feet per second, total
Pacheco Conduit	7.9 miles	120 inches	490 cubic feet per second
Santa Clara Tunnel and Conduit			
Tunnel:	1.0 mile	Designed at 102 inches. Constructed at 117 inches without additional cost.	397 cubic feet per second
Conduit:	21.3 miles	96 inches	330 cubic feet per second
Coyote Pumping Plant Six units—12,000 hp total*** 259 feet maximum lift			300 cubic feet per second, total
Hollister Conduit	19.1 miles	54 and 60 inches****	93 cubic feet per second
Calaveras Fault Crossing	2,370 feet	Two parallel 66-inch pipes	

*** Change to reflect final design considerations.
**** Change in minimum pipe size and to provide operational flexibility.



SAN FELIPE DIVISION

BUREAU OF RECLAMATION

CALIFORNIA STATE WATER PROJECT

GENERAL

Authorized by the Legislature in 1959, and operated by the State Department of Water Resources (DWR), the Project includes 19 dams and reservoirs.

The Project originally provided for transportation of water across the Delta, initially through use of Delta channels, but ultimately through construction of a facility for transportation of the water to pumps near Tracy. The District is one of 30 State Water Project (SWP) contractors.

THE DELTA

A 738,000-acre area where the Sacramento and San Joaquin Rivers converge and discharge more than 40 percent of California's freshwater into San Francisco Bay. Provides a drinking water source for over two-thirds of California's population.

There are 1,100 miles of levees and 700 miles of waterways either serving or protecting the 550,000 acres of irrigated agricultural land in the Delta.

CALIFORNIA AQUEDUCT

This 444-mile long aqueduct (not including another 96 miles of branch aqueducts) is the main project of the State Water Project.

SOUTH BAY AQUEDUCT

Initial water delivery in 1965. It is the branch of the California Aqueduct that brings water to communities in the San Francisco Bay Area. About one-fourth of Santa Clara County's water; 100,000 acre-feet (or 32.6 billion gallons) comes through the 43-mile long South Bay Aqueduct every year.

Name	Almaden	Anderson	Calero	Chesbro	Coyote
Drainage Area (square miles above dam)	12	192.7	6.9	19.5	121
Year Constructed	1935	1950	1935	1955	1936
Reservoir Capacity (a/f)	1,780	89,073	10,050	8,952	22,925
Reservoir Surface Area when full (acres)	59	1,245	347	265	648
Reservoir Length (miles)	1.1	7.8	2.2	2.4	4.8
Dam Type	Rolled Earth Fill	Rolled Earth & Rock Fill	Rolled Earth Fill	Rolled Earth Fill	Rolled Earth & Rock Fill
Dam Height (crest above streambed in feet)	105	240	98	95	138
Dam Crest Elevation	615	640	489	535	802
Dam Crest Length (feet)	460	1,385	840	690	970
Dam Crest Width (feet)	20	40	20	20	100
Dam Base Width (feet)	545	1,100	495	430	945
Cubic Yards of Fill	250,000	3,320,000	550,000	430,000	1,060,000
Outlet Pipe Diameter (inches)	36	49	36	56	8' tunnel
Outlet Pipe Length (feet)	576	1,160	481	480	702
Outlet Valves	Butterfly	Butterfly	Butterfly	Butterfly	Fixed Cone Valve, Ball Valve
Spillway Type	Side Channel	Chute	Chute	Chute	Chute
Spillway Design Capacity (cubic feet per second)	7,000	57,400	5,260	11,000	33,000
Spillway Crest Elev. (feet)	606.9	625.0	483.3	525	777.2
Freeboard (feet)	8	15	6.5	10	25
Average Annual Yield (a/f)	4,727	10,717	5,963	10,400	24,118

Dams and Reservoirs (continued)

Name	Guadalupe	Lexington	Stevens Crk	Uvas	Vasona
Drainage Area (square miles above dam)	5.9	37.5	17.3	30	43.9
Year Constructed	1935	1952	1935	1957	1935
Reservoir Capacity (a/f)	3,228	19,834	3,465	9,901	400
Reservoir Surface Area when full (acres)	79	475	92	286	57
Reservoir Length (miles)	1.1	2.5	1.1	2.2	0.8
Dam Type	Rolled Earth Fill	Rolled Earth Fill	Rolled Earth Fill	Rolled Earth Fill	Rolled Earth & Concrete Buttress
Dam Height (crest above streambed in feet)	129	195	120	105	30
Dam Crest Elevation	627	667	545	500	305
Dam Crest Length (feet)	650	830	1,000	1,100	1,000
Dam Crest Width (feet)	20	40	20	20	20
Dam Base Width (feet)	650	1,370	620	600	153
Cubic Yards of Fill	520,000	2,124,000	530,000	800,000	70,000
Outlet Pipe Diameter (inches)	36	50	50	36	N/A
Outlet Pipe Length (feet)	720	1,314	680	880	20
Outlet Valves	Butterfly	Butterfly	Butterfly	Butterfly	Sluice Gates
Spillway Type	Side Channel	Chute	Side Channel	Chute	Concrete Buttress & Radial Gate
Spillway Design Capacity (cubic feet per second)	6,000	20,000	15,715	Not Det.	12,600
Spillway Crest Elev. (feet)	617.3	649.9	535.0	487.5	294.8
Freeboard (feet)	9.7	15	10.2	12.5	10
Average Annual Yield (a/f)	5,080	21,102	4,910	27,100	—

CANALS AND PIPELINES

CANALS

Canals	Capacity (CFS)	Length (Miles)	Composition
Almaden-Calero	120	4.4	Concrete-lined
Coyote	125	9.0	Natural
Kirk Ditch	35	1.9	Open channel pipeline
Page Ditch	50	2.0	Natural channel
TOTALS	**280**	**17.3**	

PIPELINES—RAW WATER

Pipelines	Pipe Diameter (Inches)	Length (Miles)	Composition
Almaden Valley	72–78	12.3	Welded-steel and prestressed concrete
Anderson Force Main	54	.8	Pretensioned
Calero	78	2.6	PCCP*
Central	66	13.1	Prestressed concrete & steel
Coyote-Madrone	24	2.0	Reinforced concrete
Cross Valley	78	8.8	PCCP
Gilroy Reclamation (co-owned)	12	9.0	Steel
Hollister Conduit	54-60	19.1	PCCP
Main Avenue	16-24	1.0	Steel and concrete
Pacheco Conduit I and II	120	7.9	PCCP
Penitencia Force Main	66	0.3	PCCP
Rinconada Force Main	72	1.0	Prestressed concrete & steel
Santa Clara Conduit I and II	96	20	Steel
Santa Teresa Force Main	66	0.3	N/A
Stevens Creek	20-37	9.8	N/A
Uvas-Llagas Transfer	27-39	2.8	Reinforced concrete pressure
TOTAL		**110.8**	

*PCCP = Prestressed-concrete-cylinder-pipe

PIPELINES—TREATED WATER

Pipelines	Pipe Diameter (Inches)	Length (Miles)	Composition
Campbell Distributary	20	2.0	Steel
East	33-48	6.4	Steel
Graystone	36	0.2	Steel
Milpitas	42	4.6	Steel
Mountain View Distributary	24	1.1	Steel Pipe
Parallel East	54	4.1	PCCP*
Penitencia Delivery Main	60	0.3	PCCP and steel
Santa Clara Distributary	30-36	4.0	Steel
Snell	60-72	9.7	PCCP
Sunnyvale Distributary	33	0.5	Steel
West	30-84	9.0	Concrete cylinder pipe and steel pipe
TOTAL		**41.9**	

* PCCP = Prestressed-concrete-cylinder-pipe

PUMP STATIONS, WATER TREATMENT PLANTS, AND HYDROELECTRIC FACILITIES

PUMP STATIONS

Pump Stations	Installed Horsepower
Coyote Pump Station	12,000
Pacheco Pump Station	24,000
Vasona Pump Station	1,200

WATER TREATMENT PLANTS

Treatment Plant	Present Capacity (Million Gallons Per Day)	Future Capacity (Million Gallons Per Day)
Penitencia	40 mgd	45 mgd
Rinconada	70 mgd	120 mgd
Santa Teresa	80 mgd	100 mgd

HYDROELECTRIC FACILITIES

Facility	Installed KW	1000 KW hour/year
Anderson Hydroelectric	900	4,150

TREATED WATER RATES (PER ACRE-FOOT)

WATER YEAR	CONTRACT	NON-CONTRACT
1967/68	$62.00	
1968/69	$62.00	
1969/70	$64.60	$35.00
1970/71	$64.60	$35.00
1971/72	$65.00	$38.00
1972/73	$65.00	$38.00
1973/74	$65.00	$38.00
1974/75	$65.00	$38.00
1975/76	$65.00	$41.00
1976/77	$75.00	$45.00
1977/78	$75.00	$46.00
1978/79	$80.00	$53.00
1979/80	$85.00	$60.00
1980/81	$95.00	$70.00
1981/82	$130.00	$86.00
1982/83	$140.00	$100.00
1983/84	$150.00	$105.00
1984/85	$160.00	$110.00
1985/86	$170.00	$118.00
1986/87	$180.00	$123.00
1987/88	$190.00	$128.00
1988/89	$195.00	$128.00
1989/90	$210.00	$183.00
1990/91	$245.00	$225.00
1991/92	$332.00	$312.00
1992/93	$332.00	$312.00
1993/94	$310.00	$290.00
1994/95	$310.00	$290.00
1995/96	$310.00	$290.00
1996/97	$310.00	$290.00
1997/98	$310.00	$270.00

GROUNDWATER RATES (PER ACRE-FOOT)
ZONES W-2 AND W-5

	W-2		W-5	
WATER YEAR	AG	NON-AG	AG	NON-AG
1964/65	$5.00	$20.00		
1965/66	$5.00	$16.00		
1966/67	$5.00	$16.00		
1967/68	$5.00	$16.00		
1968/69	$8.00	$26.40		
1969/70	$8.00	$29.00		
1970/71	$8.00	$29.00		
1971/72	$8.00	$30.00		
1972/73	$8.00	$30.00		
1973/74	$8.00	$30.00		
1974/75	$8.00	$30.00		
1975/76	$8.00	$30.00		
1976/77	$8.50	$34.00		
1977/78	$8.50	$34.00		
1978/79	$9.75	$39.00		
1979/80	$11.00	$44.00		
1980/81	$13.50	$54.00		
1981/82	$17.50	$70.00		
1982/83	$18.75	$75.00		
1983/84	$20.00	$80.00		
1984/85	$21.25	$85.00		
1985/86	$22.50	$90.00		
1986/87	$23.75	$95.00		
1987/88	$25.00	$100.00	$5.50	$22.00
1988/89	$25.00	$100.00	$6.50	$26.00
1989/90	$31.25	$135.00	$9.75	$39.00
1990/91	$43.75	$175.00	$11.50	$46.00
1991/92	$43.75	$262.00	$11.50	$117.00
1992/93	$43.75	$262.00	$11.50	$117.00
1993/94	$43.75	$240.00	$11.50	$108.00
1994/95	$43.75	$240.00	$11.50	$108.00
1995/96	$43.75	$240.00	$11.50	$108.00
1996/97	$43.75	$240.00	$11.50	$108.00
1997/98	$43.75	$240.00	$11.50	$108.00

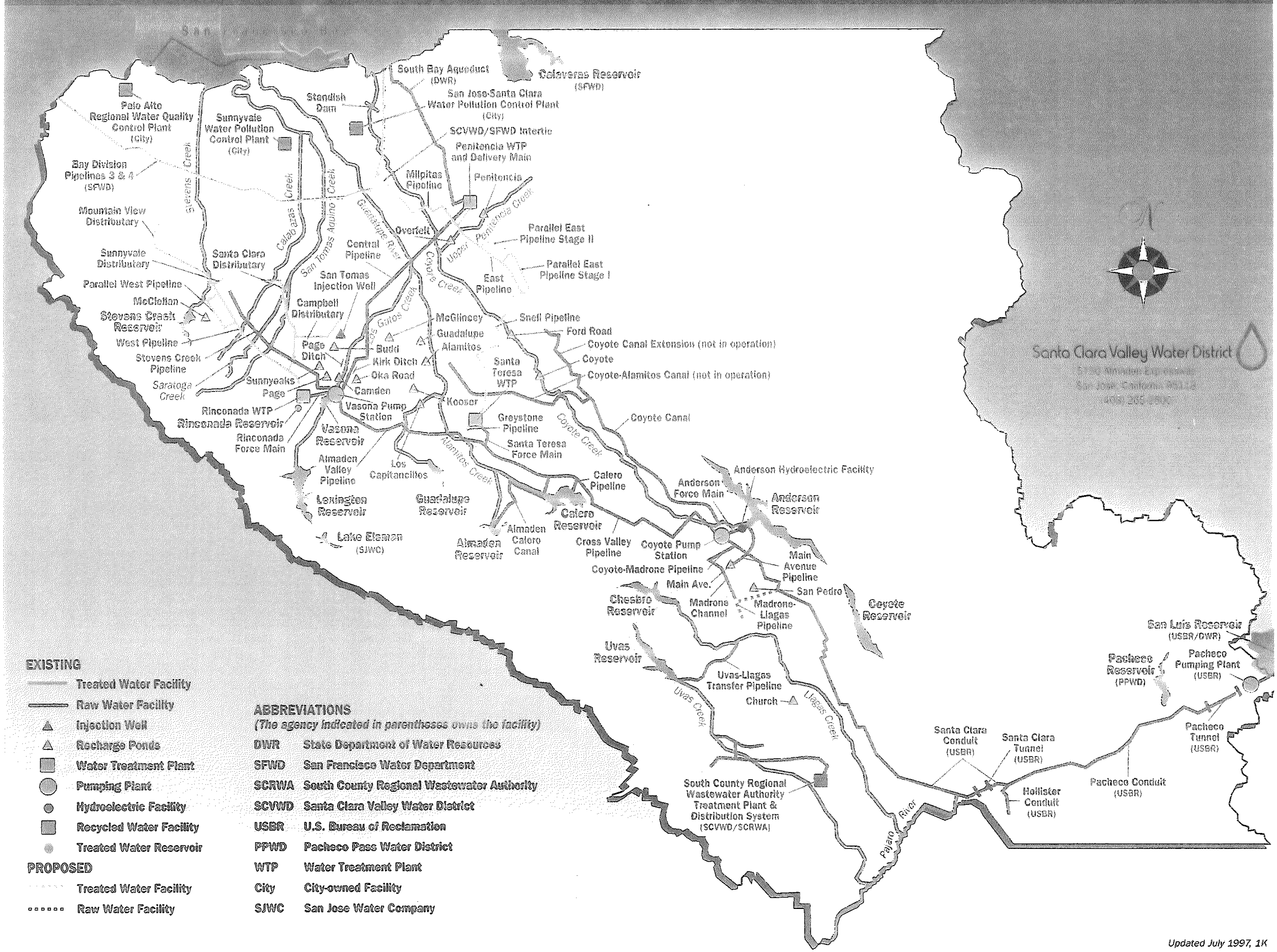
SURFACE WATER RATES (PER ACRE-FOOT)
ZONES W-2, W-3, AND W-5

	ZONE W-2						ZONES W-3 & W-5					
WATER YEAR	AG	NON-AG	WATER MSTR	MIN CHG	POWER	WHEEL CHG	AG	NON-AG	WATER MSTR	MIN CHG	POWER	CAPITAL COSTS
1964/65	$2.25	$8.85	$1.75	$5.00	$5.00				$3.00			
1965/66	$8.10	$25.70	$1.75	$10.00	$5.00				$3.00			
1966/67	$8.50	$26.90	$1.75	$20.00	$5.00				$3.00			
1967/68	$9.00	$27.40	$1.75	$20.00	$5.00				$3.00			
1968/69	$8.00	$26.40	$2.50	$20.00	$5.00				$3.00			
1969/70	$8.00	$29.00	$2.50	$20.00	$5.00				$3.00			
1970/71	$8.00	$29.00	$2.50	$20.00	$5.00				$3.00			
1971/72	$8.00	$30.00	$4.00	$20.00	$5.25				$4.00			
1972/73	$8.00	$30.00	$4.00	$20.00	$5.25				$4.00			
1973/74	$8.00	$30.00	$4.00	$20.00	$5.25				$4.00			
1974/75	$8.00	$30.00	$4.00	$20.00	$5.75				$4.00			
1975/76	$8.00	$30.00	$4.00	$20.00	$5.75				$4.00			
1976/77	$8.50	$34.00	$5.50	$26.00	$8.50				$5.50			
1977/78	$8.50	$34.00	$5.75	$26.00	$18.50				$5.75			
1978/79	$9.75	$39.00	$6.50	$30.00	$18.50				$6.50		$3.75	$2.75
1979/80	$11.00	$44.00	$6.50	$33.00	$19.00				$6.50		$3.50	$2.75
1980/81	$13.50	$54.00	$6.50	$39.00	$19.00				$6.50		$10.00	$2.75
1981/82	$17.50	$70.00	$7.00	$49.00	$28.00				$7.00		$10.00	$2.75
1982/83	$18.75	$75.00	$8.00	$53.00	$33.00				$8.00		$0.00	$2.75
1983/84	$20.00	$80.00	$8.00	$56.00	$35.00				$8.00		$4.00	$2.75
1984/85	$21.25	$85.00	$9.00	$60.00	$32.00				$9.00		$4.00	$2.75
1985/86	$22.50	$90.00	$9.00	$63.00	$35.00				$9.00		$4.00	$2.75
1986/87	$23.75	$95.00	$9.00	$66.00	$37.00				$9.00		$4.00	$2.75
1987/88	$25.00	$100.00	$9.50	$70.00	$37.00		$5.50	$22.00	$9.50	$23.00	$4.00	$2.75
1988/89	$25.00	$100.00	$10.00	$85.00	$37.00		$6.50	$26.00	$10.00	$29.50	$6.50	$2.75
1989/90	$31.25	$135.00	$10.50	$111.75	$37.00		$9.75	$39.00	$10.50	$39.75	$6.50	$2.75
1990/91	$43.75	$175.00	$11.25	$142.50	$37.00		$11.50	$46.00	$11.25	$45.75	$6.50	$2.75
1991/92	$43.75	$262.00	$11.75	$196.50	$37.00		$11.50	$117.00	$11.75	$87.75		$2.75
1992/93	$43.75	$262.00	$11.75	$196.50	$37.00		$11.50	$117.00	$11.75	$87.75		$2.75
1993/94	$43.75	$240.00	$11.75	$180.00	$37.00		$11.50	$108.00	$11.75	$81.00		$2.75
1994/95	$43.75	$240.00	$11.75	$180.00	$37.00	$156.00	$11.50	$108.00	$11.75	$81.00		$2.75
1995/96	$43.75	$240.00	$11.75	$180.00	$37.00	$156.00	$11.50	$108.00	$11.75	$81.00		$2.75
1996/97	$43.75	$240.00	$11.75	$180.00	$37.00	$156.00	$11.50	$108.00	$11.75	$81.00		$2.75
1997/98	$43.75	$240.00	$11.75	$180.00	$37.00	$156.00	$11.50	$108.00	$11.75	$81.00		$2.75

RECYCLED WATER RATES (PER ACRE-FOOT)

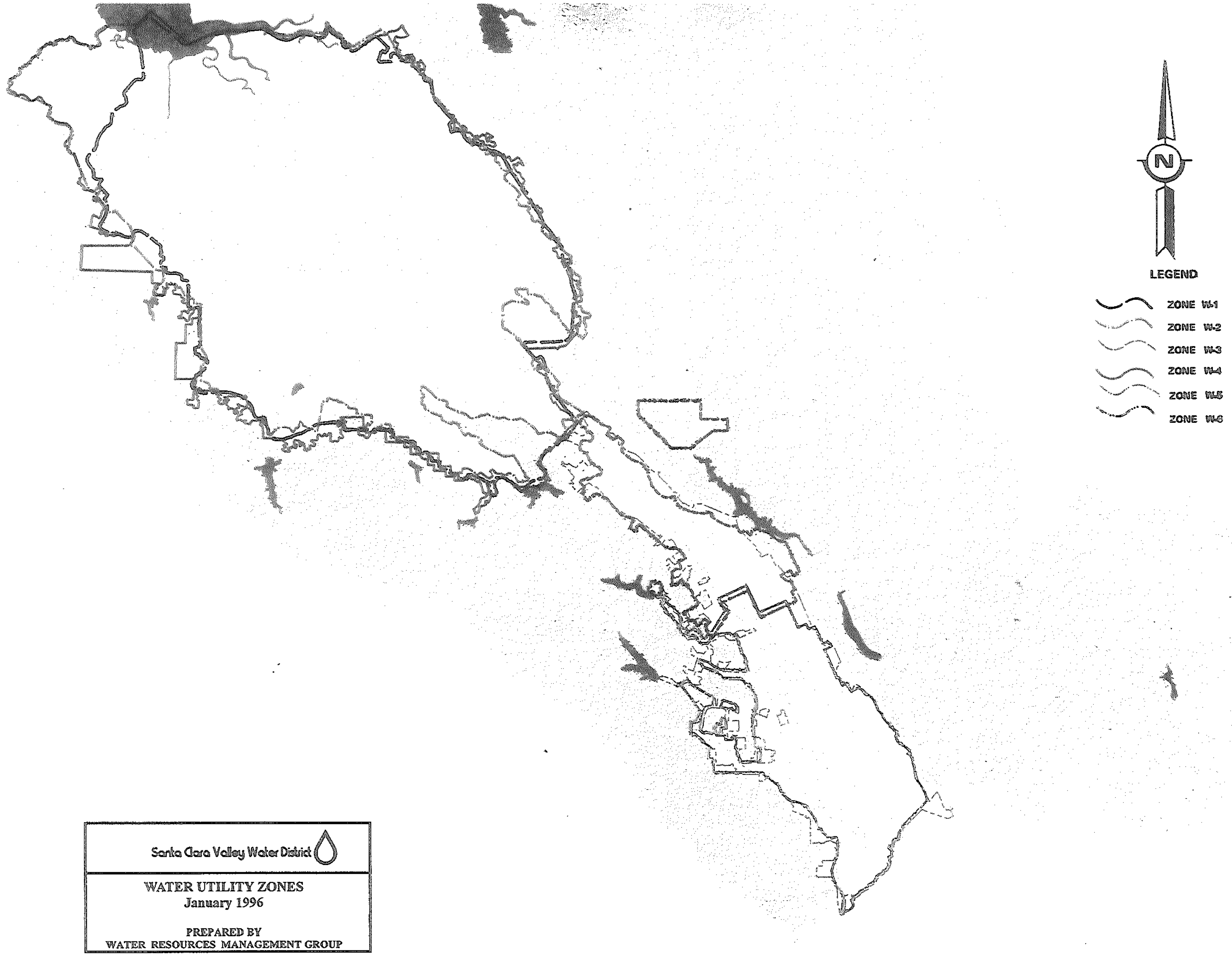
	GILROY		CITY OF PALO ALTO			
WATER YEAR	AG	NON-AG	AG	NON-AG	WATER MASTER	POWER
1977/78	$10.00	$40.00	$8.50	$34.00	$5.75	$2.00
1978/79	$10.00	$40.00	$9.75	$39.00	$6.50	$2.00
1979/80	$10.00	$40.00	$11.00	$44.00	$6.50	$2.00
1980/81	$10.00	$40.00	$13.50	$54.00	$6.50	$2.00
1981/82	$20.00	$80.00	$17.50	$70.00	$7.00	$4.00
1982/83	$20.00	$80.00	$18.75	$75.00	$8.00	$4.00
1983/84	$20.00	$80.00	$20.00	$80.00	$8.00	$4.00
1984/85	$20.00	$80.00	$21.25	$85.00	$9.00	$4.00
1985/86	$20.00	$80.00	$22.50	$90.00	$9.00	$4.00
1986/87	$20.00	$80.00				
1987/88	$20.00	$80.00				
1988/89	$20.00	$80.00				
1989/90	$20.00	$80.00				
1990/91	$20.00	$80.00				
1991/92	$20.00	$80.00				
1992/93	$20.00	$80.00				
1993/94	$20.00	$80.00				
1994/95	$20.00	$80.00				
1995/96	$20.00	$80.00				
1996/97	$20.00	$80.00				
1997/98	$20.00	$80.00				

Water Conveyance, Treatment & Distribution System



Updated July 1997, 1K

WATER UTILITY ZONES

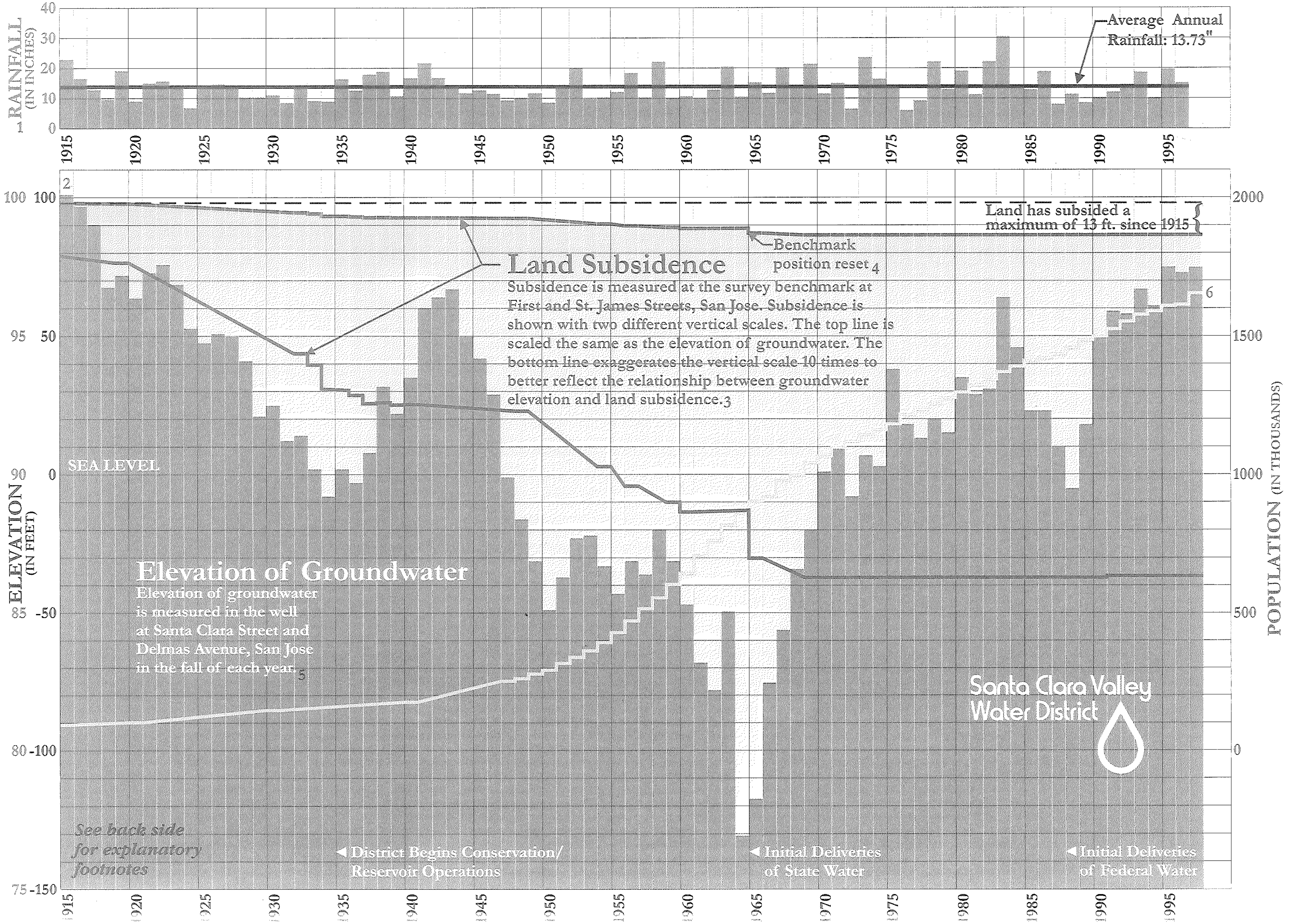


Santa Clara Valley Water District

WATER UTILITY ZONES
January 1996

PREPARED BY
WATER RESOURCES MANAGEMENT GROUP

RELATIONSHIP BETWEEN GROUNDWATER ELEVATIONS AND LAND SUBSIDENCE IN SANTA CLARA COUNTY



Land Subsidence

Subsidence is measured at the survey benchmark at First and St. James Streets, San Jose. Subsidence is shown with two different vertical scales. The top line is scaled the same as the elevation of groundwater. The bottom line exaggerates the vertical scale 10 times to better reflect the relationship between groundwater elevation and land subsidence.3

Elevation of Groundwater

Elevation of groundwater is measured in the well at Santa Clara Street and Delmas Avenue, San Jose in the fall of each year.5

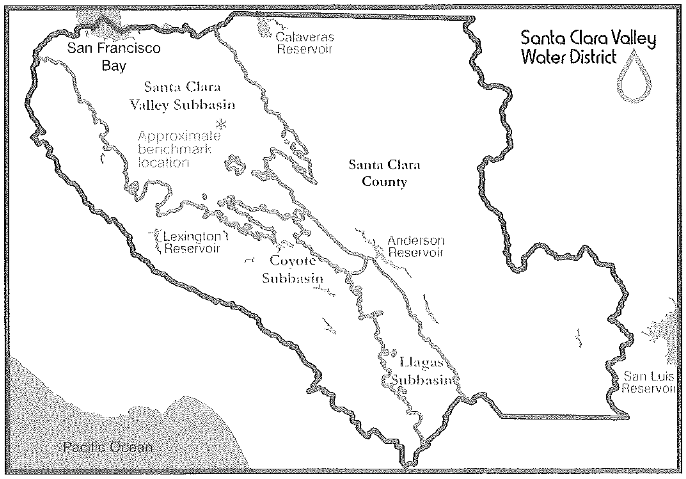
See back side for explanatory footnotes

RELATIONSHIP BETWEEN GROUNDWATER ELEVATIONS AND LAND SUBSIDENCE IN SANTA CLARA COUNTY

The groundwater basin–our largest reservoir

The Santa Clara Valley overlies a large groundwater basin, or aquifer, divided into three subbasins (see map). Aquifers are typically composed of varying layers of sand and loose, porous soils (such as loamy soils), containing small air pockets in which water can reside and flow. Aquifers also typically include one or more layers of dense clay.

Determining the exact storage capacity of an aquifer is quite difficult. The water district estimates the capacity of the valley's three subbasins to be much greater (perhaps five times greater) than all of the district's surface reservoirs combined. Together, the district's 10 surface reservoirs have a capacity of 170,137 acre feet, with Anderson Reservoir being the largest at 89,073 acre feet. The groundwater basin can thus be viewed as our county's largest reservoir and, in fact, is used in that manner: In 1997, 174,954 acre feet of groundwater was pumped, supplying almost half of the water used in Santa Clara County.



Preventing land subsidence

The water district recharges the subbasin with water not only to counterbalance pumping and maintain the supply of groundwater, but also to prevent land subsidence. Subsidence is the broad sagging of the land surface over many miles as a result of decreased water pressure in the subbasin (see footnote #5). In Santa Clara County, one serious consequence of subsidence was that lands near the Bay sank below sea level between 1940 and 1970, enabling salt water to intrude upstream through the mouths of rivers, dramatically affecting the riparian habitat of those rivers. Also of consequence was the increased potential for tidal flooding, requiring the district to construct a levee system along the Bay's edge.

The district uses local and imported water to recharge the basin. This water is recharged in 393 acres of percolation ponds, located throughout the county. Seasonal dams on creeks and rivers are also used to encourage instream recharge.

EXPLANATORY FOOTNOTES

1. Rainfall directly influences groundwater elevations. Rainfall naturally seeps into the subbasin, helping to restore or "recharge" depleted groundwater. The chart reflects the correlation between wet years and higher water elevations and between dry years and lower water elevations.

2. Water that bubbles up from a well is known as an artesian well. This occurs when the elevation of water or groundwater pressure is so high that water springs up through wells to the surface. In 1915, the benchmark well acted in this manner.

3. The benchmark for measuring land subsidence is tracked by district surveyors. This benchmark is within walking distance of the well where the elevation of groundwater, or depth to water, is measured.

4. The survey benchmark which measures subsidence was originally in the Hall of Records building in San Jose. That building was demolished and replaced with a new Superior Court building. A new survey benchmark disk was set in the wall of the new building.

5. The chart reflects the elevation of groundwater at the downtown San Jose well only. (The chart is not indicative of water levels and subsidence across the valley.) Drops or rises in water elevation result in corresponding decreases or increases in the water pressure in the aquifer. It is the pressure, rather than the water table itself, that affects land subsidence. The aquifer can withstand varying rises and drops in water levels, but when there is a significant and steady drop in water pressure, the clay layers compress downward and compact the clay fractions. The surface level sinks with this compression. The pressure level at which subsidence will take place is difficult to ascertain. The district's current policy is to maintain a groundwater elevation above the level where subsidence was last noted.

6. As the population of the valley increased, so did water consumption. Importing water through the State Water Project and federal Central Valley Project increased the district's water supplies, reducing the need to pump heavily from the basin as well as providing water for recharge purposes. In the late 1960s, groundwater pressure recovered and subsidence was halted.

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